

## Erratum to

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## Erratum: Differential branching fraction and angular analysis of $\Lambda_b^0 \rightarrow \Lambda \mu^+ \mu^-$ decays

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The angular distribution of the dimuon system of the decays  $\Lambda_b^0 \rightarrow \Lambda \mu^+ \mu^-$  and  $\bar{\Lambda}_b^0 \rightarrow \bar{\Lambda} \mu^+ \mu^-$  can be described by

$$\frac{d\Gamma}{d\cos\theta_\ell} = \frac{3}{8}(1 + \cos^2\theta_\ell)(1 - f_L) + A_{\text{FB}}^\ell \cos\theta_\ell + \frac{3}{4}f_L \sin^2\theta_\ell, \quad (1)$$

where  $A_{\text{FB}}^\ell$  is the forward-backward asymmetry of the dimuon system and  $f_L$  is its longitudinal polarisation fraction. For the  $\Lambda_b^0$  decay, the angle  $\theta_\ell$  is calculated as the angle between the direction of the  $\mu^+$  lepton, in the rest frame of the dimuon pair, and the direction of the dimuon pair, in the rest frame of the  $\Lambda_b^0$  decay. The forward-backward asymmetry of the lepton pair,  $A_{\text{FB}}^\ell$ , is “odd” under  $CP$  conjugation and changes in sign between the  $\Lambda_b^0$  and  $\bar{\Lambda}_b^0$  decays. To compensate for this sign, the angle  $\theta_\ell$  is usually calculated from the  $\mu^-$  lepton rather than the  $\mu^+$  lepton such that  $A_{\text{FB}}^\ell$  can be calculated from the combined sample. This was the intended approach of this paper. Unfortunately,  $A_{\text{FB}}^\ell$  was determined using the  $\mu^+$  lepton when determining  $\theta_\ell$  for both the  $\Lambda_b^0$  and the  $\bar{\Lambda}_b^0$  decays. Consequently, the value of  $A_{\text{FB}}^\ell$  in this paper corresponds to a difference  $A(A_{\text{FB}}^\ell)$  in asymmetries between the  $\Lambda_b^0$  and  $\bar{\Lambda}_b^0$  decays rather than a proper average and is expected to be zero if  $CP$  is conserved. The result quoted as  $A_{\text{FB}}^\ell$  in this paper should therefore be interpreted as

$$A(A_{\text{FB}}^\ell) = -0.05 \pm 0.09 (\text{stat}) \pm 0.03 (\text{syst}), \quad (2)$$

and is indeed consistent with the Standard Model expectation that  $CP$  violating effects should be small in the decay  $\Lambda_b^0 \rightarrow \Lambda \mu^+ \mu^-$ . This is in itself a useful result. A measurement of  $A_{\text{FB}}^\ell$  has since been presented in ref. [1]. The results in ref. [1] supersede the corresponding results in this paper. Note, the mistake in the angular definition only affects the value of  $A_{\text{FB}}^\ell$  presented in the paper. The values of  $f_L$ ,  $A_{\text{FB}}^h$  and the differential branching fraction are unchanged, due to the symmetry of the efficiency model in  $\cos\theta_\ell$ .

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